

**The Claims**

1. A glass sheet intended to be thermally toughened, comprising a silica-soda matrix, wherein said sheet has an expansion coefficient  $\alpha$  of greater than  $100 \times 10^{-7} \text{ K}^{-1}$ , a Young's modulus E of greater than 60 GPa and a thermal conductivity k of less than 0.9 W/m.K.

2. The glass sheet of claim 1, wherein said sheet has a Poisson's ratio of greater than 0.21.

3. The glass sheet of claim 2, wherein said sheet has a specific heat of greater than 7.40 J/kg.K.

4. The glass sheet of claim 1, wherein said sheet has a specific heat of greater than 7.40 J/kg.K.

5. The glass sheet of claim 1, wherein said sheet has a density of greater than 2520 kg/m<sup>3</sup>.

6. The glass sheet of claim 1, wherein said sheet satisfies the relationship:

$$\alpha \cdot E / K > 8000.$$

7. The glass sheet of claim 1, wherein said matrix comprises, in percentages by weight, the following constituents:

SiO <sub>2</sub>	45-69%
Al <sub>2</sub> O <sub>3</sub>	0-14%
CaO	0-22%
MgO	0-10%
Na <sub>2</sub> O	6-24%

K <sub>2</sub> O	0-10%
BaO	0-12%
B <sub>2</sub> O <sub>3</sub>	0-6%
ZnO	0-10%

5 and satisfies the relationships:

$$\text{Na}_2\text{O} + \text{K}_2\text{O} > 20\%$$

$$\text{Na}_2\text{O} + \text{K}_2\text{O} + \text{CaO} > 27\%.$$

10 8. The glass sheet of claim 1, wherein said matrix comprises, in percentages by weight, the following constituents:

SiO <sub>2</sub>	45-69%
Al <sub>2</sub> O <sub>3</sub>	0-14%
CaO	0-22%
MgO	0-10%
Na <sub>2</sub> O	6-24%
K <sub>2</sub> O	0-10%
BaO	0-12%
B <sub>2</sub> O <sub>3</sub>	0-6%
ZnO	0-10%

20 and satisfies the relationships:

$$\text{Na}_2\text{O} + \text{K}_2\text{O} > 17\%$$

$$\text{Na}_2\text{O} + \text{K}_2\text{O} + \text{CaO} > 35\%.$$

25 9. The glass sheet of claim 1, wherein said matrix comprises, in percentages by weight, at least one of Na<sub>2</sub>O and K<sub>2</sub>O in amounts which satisfy the following relationship:

$$\text{Na}_2\text{O} + \text{K}_2\text{O} > 17\%.$$

30 10. The glass sheet of claim 1, wherein said matrix comprises, in percentages by weight, the following constituents:

SiO <sub>2</sub>	45-69%
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$\text{Al}_2\text{O}_3$	0-14%
$\text{CaO}$	0-22%
$\text{MgO}$	0-10%
$\text{Na}_2\text{O}$	6-24%
$\text{K}_2\text{O}$	0-10%
$\text{BaO}$	0-12%
$\text{B}_2\text{O}_3$	0-6%
$\text{ZnO}$	0-10%

and satisfies the relationships:

(a)  $\text{Na}_2\text{O} + \text{K}_2\text{O} > 17\%$ , and

(b)  $\text{Na}_2\text{O} + \text{K}_2\text{O} + \text{CaO} > 29\%$  when at least one of  $\text{Na}_2\text{O} > 18\%$ ,  $\text{K}_2\text{O} > 5\%$ , and  $\text{Al}_2\text{O}_3 < 3\%$ .

11. The glass sheet of claim 9, wherein said matrix comprises, in percentages by weight, at least one of  $\text{TiO}_2$  and  $\text{Al}_2\text{O}_3$  in amounts which satisfy the relationship:

$$\text{TiO}_2 + \text{Al}_2\text{O}_3 < 3\%.$$

12. The glass sheet of claim 1, wherein said matrix comprises, in percentages by weight, at least one of  $\text{Na}_2\text{O}$ ,  $\text{K}_2\text{O}$ ,  $\text{CaO}$ , and  $\text{Al}_2\text{O}_3$  in amounts which satisfy the following relationships:

(a)  $\text{Na}_2\text{O} + \text{K}_2\text{O} > 17\%$ , and

(b)  $\text{Na}_2\text{O} + \text{K}_2\text{O} + \text{CaO} > 29\%$  when at least one of  $\text{Na}_2\text{O} > 18\%$ ,  $\text{K}_2\text{O} > 5\%$ , and  $\text{Al}_2\text{O}_3 < 3\%$ .

13. The glass sheet according to claim 1, wherein said sheet has a thickness of less than 2.5 mm and is thermally toughened.

14. The glass sheet of claim 1, wherein said matrix comprises  $\text{Na}_2\text{O}$  and optionally one or more of  $\text{K}_2\text{O}$ ,  $\text{CaO}$  or  $\text{Al}_2\text{O}_3$  in amounts which satisfy the following relationship:

$$\text{Na}_2\text{O} + \text{K}_2\text{O} + \text{CaO} > 29 \text{ wt}\%$$

when at least one of  $\text{Na}_2\text{O} > 18 \text{ wt\%}$ ,  $\text{K}_2\text{O} > 5 \text{ wt\%}$ , and  $\text{Al}_2\text{O}_3 < 3 \text{ wt\%}$ .

15. The glass sheet of claim 1, wherein said matrix has a CaO content of 10.4 to 22 wt%.

16. A glass sheet intended to be thermally toughened, comprising a silica-soda matrix, wherein said sheet has an expansion coefficient  $\alpha$  of greater than  $100 \times 10^{-7} \text{ K}^{-1}$ , a Young's modulus E of greater than 60 GPa and a thermal conductivity k of less than 0.9 W/m.K and said matrix has a  $\text{SiO}_2$  content of 45 to 65 wt%, wherein said matrix comprises  $\text{Na}_2\text{O}$  and optionally  $\text{K}_2\text{O}$  in amounts which satisfy the following relationship:

$$\text{Na}_2\text{O} + \text{K}_2\text{O} > 20 \text{ wt\%}.$$

17. A glass composition comprising, in percentages by weight:

$\text{SiO}_2$	45-69%
$\text{Al}_2\text{O}_3$	0-14%
CaO	0-22%
MgO	0-10%
$\text{Na}_2\text{O}$	6-24%
$\text{K}_2\text{O}$	0-10%
BaO	0-12%
$\text{B}_2\text{O}_3$	0-6%
ZnO	0-10%,

wherein the glass has a viscosity  $\eta$  in poise, a forming temperature at which  $\log \eta = 3.5$ , and a liquidus temperature which is less than or equal to the forming temperature.

18. The glass composition of claim 17, wherein the liquidus temperature is between  $10^\circ\text{C}$  and  $30^\circ\text{C}$  less than the forming temperature.

19. The glass composition of claim 18, wherein the glass has an expansion coefficient of greater than  $100 \times 10^{-7} \text{ K}^{-1}$ .

20. The glass composition of claim 19, wherein the glass has a Young's modulus of greater than 60 GPa.

21. The glass composition of claim 19, wherein the glass has a thermal conductivity of less than 0.9 W/m.K.

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0994746-11601  
T062T-94T660